

Implementation Plan Development for Mill Creek

Technical Advisory Committee Meeting

2/13/12



Agenda:

- **TMDL Review**
- **Implementation Plan Approach**
- **Implementation Actions**
- **Units and Costs**
- **Measurable Goals and Milestones**
- **Timeline of Implementation**
- **Funding Sources**

Water Quality Standards

VADEQ specifies the following numerical criterion (9VAC25-260-50) for aquatic life:

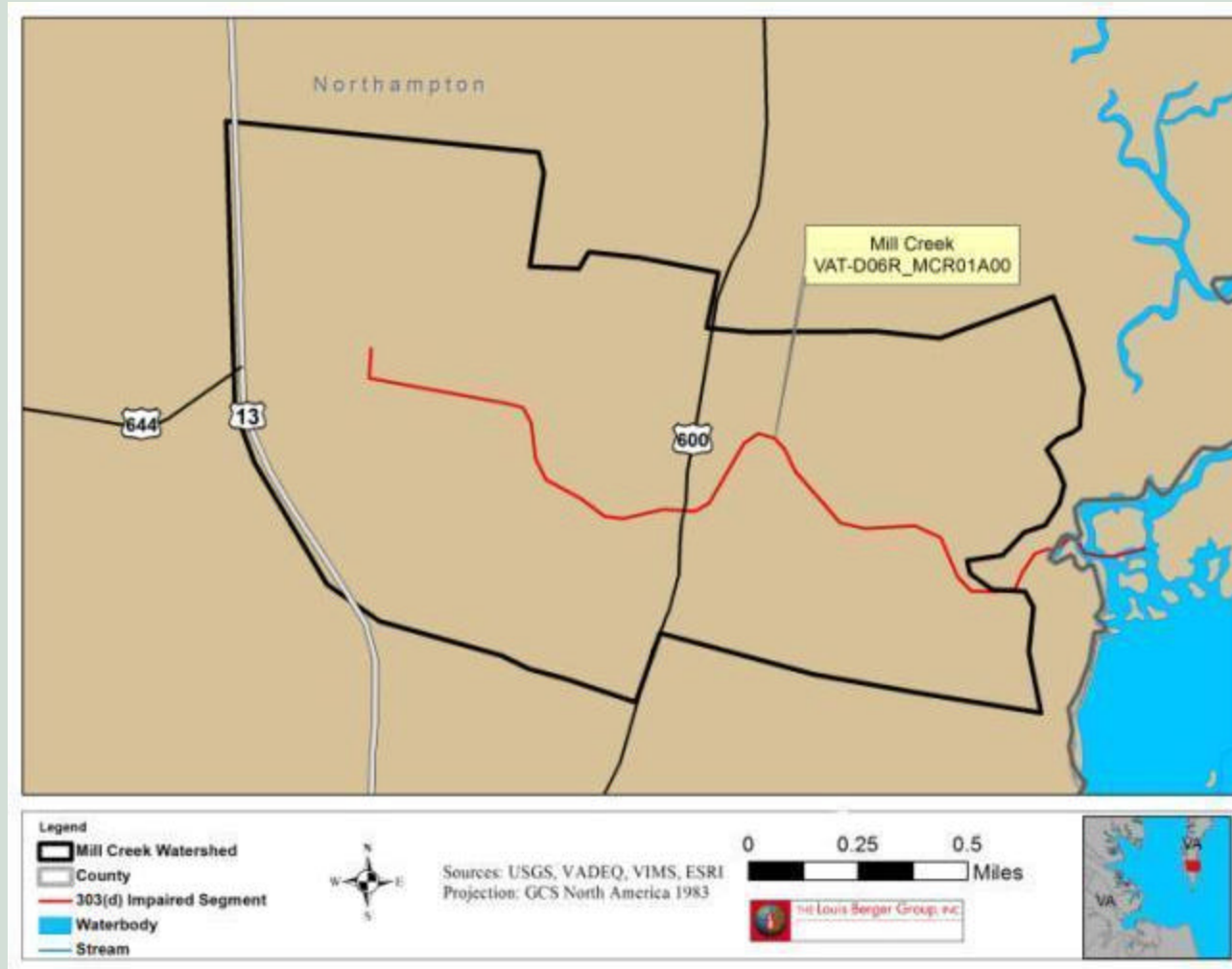
- **pH in the waterbody must remain between 6.0 and 9.0 all times**
- **DO for Class III waters must remain above 4.0 mg/L and a daily average of 5.0 mg/L**

Bacteria Impairment Summary for Mill Creek

TMDL ID	Assessment Unit	Stream Name	Impairment for	Exceedance Rate*	Length (mi)
VAT-D06R-01-PH	VAT-DO6R_MCR01A00	Mill Creek	pH	5 violates / 9 obs.	2.33
			DO	4 violates / 9 obs.	2.33

Location of the Impaired Segment in Mill Creek

- **Mill Creek Total Area: 1,094 acres**
- **Located within Northampton County**
- **Major Roads:**
 - **Bordered by Highway 13**
 - **Highway 600**



VIMS DO TMDL

- **VIMS (Virginia Institute of Marine Science) completed a Dissolved Oxygen TMDL for Mill Creek in April 2009**
 - **Excessive Organic Carbon and Nitrogen were determined as the primary cause of the impairment**
 - **Primary source is manure and fertilizer application**

Link between low DO and low pH

- **Existing DO impairment and “minor” pH impairment supports a nested approach**
- **Addressing the causes of the DO impairments will also address the pH issue**
 - **Excessive nutrient and carbon loads from agriculture, wildlife, and failing septic systems**
- **There is a link with the low DO and excessive nutrient and carbon, algal productivity and the low pH in Mill Creek**
 - **Biomass productivity during the peak growing season (induced by eutrophication) that lowers the pH**

VIMS TMDL Allocations

Estimated Loads and Load Reductions for TOC, TN, and TP

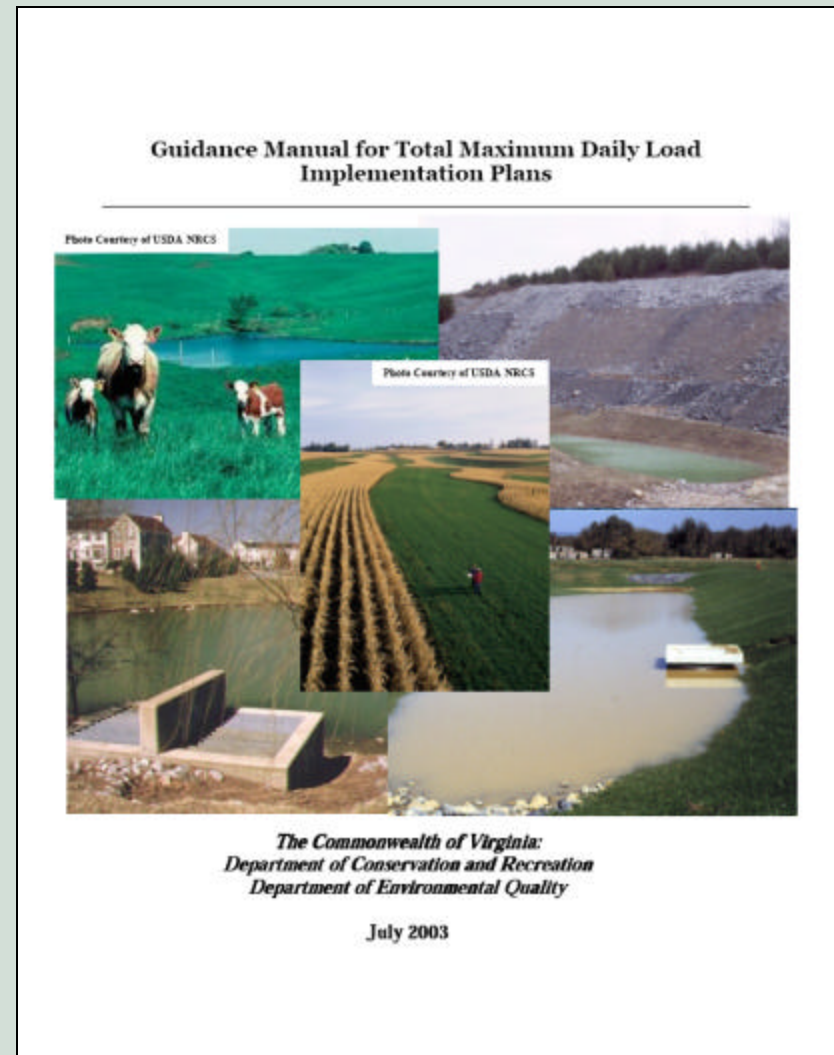
Pollutant	Current Load (lb/day)	Allowable Load (lb/day)	Required Reduction (%)
TOC	76.34	30.53	60%
TN	25.18	10.07	60%
TP	0.77	0.77	0%

TMDLs and Load Allocation (lb/day)

Nutrient	TMDL	=	LA	+	WLA	+	FA	+	MOS
TOC	30.53	=	28.69	+	N/A	+	0.31	+	1.53
TN	10.07	=	9.47	+	N/A	+	0.10	+	0.50

TMDL Implementation Plans

- Required by state legislation
- Procedures for development of implementation plans outlined in the *Guidance Manual for TMDL Implementation Plans* developed by DCR and DEQ.



Implementation Plan

- **Will mainly focus on the controllable loads of nutrient and carbon from:**

Failing septic systems and agriculture

IP Actions – Residential Controls

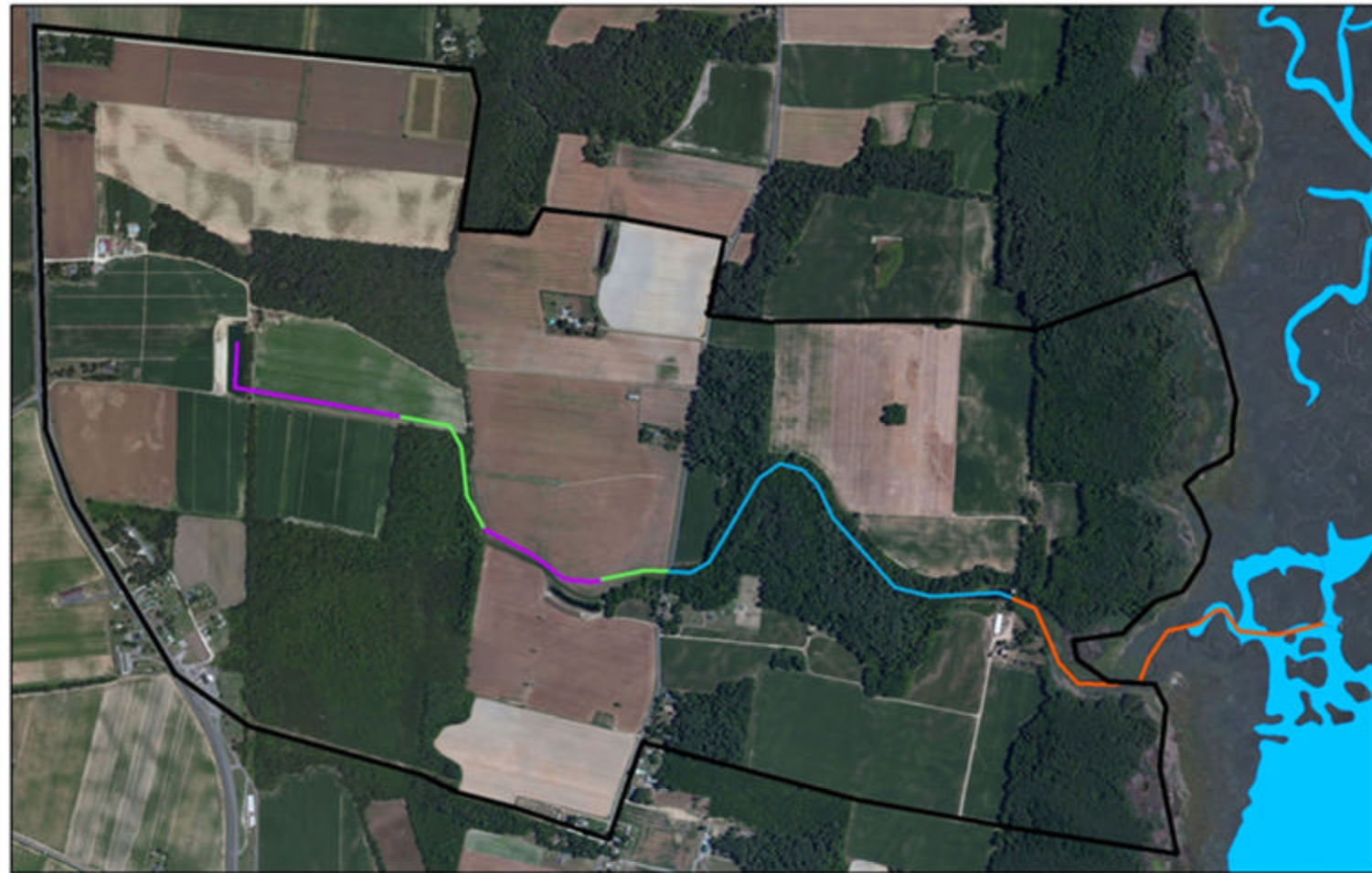
- **Reducing the loading from failing septic systems in urban and rural areas should be a primary implementation focus because of its health implications**
 - The Updated VIMS source assessment indicated there were a total of 35 septic systems, 4 failing systems estimated.

Agriculture Control Measures

- **Nutrient Management Plans in place will not be modified, are encouraged to follow**
- **Forested Riparian Buffer Zone creation**
 - 33% of Mill Creek's non-tidal portion has no riparian buffer zone
 - 22% has half a riparian buffer zone
 - 45% has a full riparian buffer zone

Riparian Zone	Length (feet)	Width of Necessary Buffer (feet)	Area of Buffer Necessary (acre)
Half Riparian Buffer	1,962	30	1.35
No Riparian Buffer	2,938	60	4.04
Total	4,900		5.39

Riparian Buffer Zones



Legend

Riparian Zone

— Full Riparian Buffer

— Half Riparian Buffer

— No Riparian Buffer

— Wetland Portion of Segment

▬ Mill Creek Watershed

Waterbody

Stream



Sources: USGS, VADEQ, VIMS, ESRI
Projection: GCS North America 1983



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Units and Costs

Mill Creek Implementation Action Costs				
Control Measures	Unit	Units Needed	Cost per unit (\$)	Total
Riparian Stream Buffer	acres	5.39	\$547	\$2,948
Septic System Replacement	system	4	\$8,000	\$32,000
Total Cost of Implementation				\$34,948

Benefits

- **Primary benefit for executing this implementation plan will be the increase in dissolved oxygen and improvement in pH in Mill Creek**
 - With the possibility of removing Mill Creek from the Virginia State Impaired Waters List
- **Planting a forested riparian buffer will keep nutrients out of the stream, which will not allow for mass growth of aquatic weeds within the creek.**
- **Secondary benefits include the synergies developed with related programs and projects and the watershed-wide incorporation of the DO/pH issue into nonpoint source pollution outreach efforts**

Measureable Goals/Milestones

- **Goal is to de-list the DO/pH impaired Mill Creek**
- **VADEQ will continue monitoring DO/pH levels in Mill Creek.**
 - Project progress will be assessed during the **fifth year** and again at the end of the **ten year** timeframe

Staged Implementation Actions				
Milestone	Specific IP Actions	Unit	Stage I (Y1 to Y5)	Stage II (Y6 to Y10)
Implementation of Actions	Riparian Stream Buffer	acres	5.4	-
	Septic System Replacement	system	4	-
Water Quality Monitoring	VADEQ Follow up monitoring	-	-	Bi monthly

Water Quality Milestones for Mill Creek	
Current Exceedance Rate of Dissolved Oxygen Standard	38
Stage I (Y1-Y5) Exceedance Rate	0
Stage II (Y6-Y10) Exceedance Rate	0

Funding Sources

- **USDA Programs - CREP/EQIP**
- **EPA Section 319 Funds**
- **Water Quality Improvement Fund**
- **State Revolving Loan Funds**
- **State Cost-Share Program**
- **State Tax Credits**
- **National Fish & Wildlife Foundation**

Next Steps - Implementation

- **Revise Draft Implementation Report**
- **Final Public Meeting at 6:30pm
on March 12th, 2012**
 - Northampton Co. Admin Bldg

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Reports/presentations available at:

www.deq.virginia.gov/tmdl/mtgppt.html



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